

## REMARKS/ARGUMENTS

### I. Fees

Applicant believes that there are no additional fees due at this time. *If there are any additional fees due in respect to this amendment, please charge them to Deposit Account No. 13-2165. Authority is hereby given to charge any such deficiency, or credit any overpayment, to Deposit Account No. 13-2165 Mathews, Collins, Shepherd & McKay. The Examiner is invited to contact the undersigned if further information is required.*

### II. 35 U.S.C. § 103(a)

It is the Examiner's opinion that claims 1 & 3-7 are unpatentable over US Patent No. 4,873,368 issued to Kadowski et al. (Kadowski). Applicant traverses this rejection on grounds that Kadowski fails to teach each and every element of the claimed invention. In particular it is the Examiner stated that "All of the claims have been amended to require that the absorbent is introduced into said acrylic acid absorption column at a mass flow rate in the range of 0.1 - 1.5 times the mass flow rate of propylene introduced into said first reactor." The applicant agrees with the Examiner on this point and respectfully wishes to bring to the Examiner's attention that Kadowski does not disclose or teach this limitation.

In response to an amendment after final the Examiner has continued the rejection and further stated:

those of ordinary skill would expect that at least a portion of the absorbent in Kadowski is introduced into the absorption column at a mass flow rate in the range of 0.1 times the mass flow rate of propylene introduced into

the reactor. Those of ordinary skill would recognize that 0.1 is within the margin of error in measuring flow rates and thus falls within the teachings of Kadowski. The examiner notes that there is no objective evidence to the contrary regarding the flow rates of Kadowski.

The Applicant is puzzled by this statement as it appears to argue that where “there is no objective evidence to the contrary” elements of the applicant’s claims that are not disclosed by the prior art “falls within the teachings” of the prior art.

The Examiner has not provided a reference or taken official notice of this fact. Applicant respectfully requests that the Examiner supply a suitable reference or withdraw the rejection under 35 U.S.C. § 103(a).

A prior art reference must describe and enable the claimed invention with sufficient clarity and detail to establish that the subject matter already existed in the prior art and that its existence was recognized by persons of ordinary skill in the field of the invention<sup>1</sup>. The general skill in the art does not supply missing knowledge for prior art.

The Federal Circuit stated:

To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher<sup>2</sup>.

While an obviousness rejection may be based on an Examiner's personal knowledge, the Examiner's ability to use personal knowledge is qualified by Section 1.107, which states:

When a rejection in an application is based on facts within the personal knowledge of an employee of the Office, the data shall be as specific as possible, and the reference must be supported, when called for by the applicant, by the

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<sup>1</sup> *Elan Pharms. Inc. v. Mayo Found. for Med. Educ. & Research*, 304 F.3d 1221, 64 USPQ2d 1292, 1296 (Fed. Cir. 2002).

<sup>2</sup> *W. L. Gore & Assoc. v. Garlock, Inc.*, 721 F.2d 1540, 1553, 220 USPQ 303, 312-13 (Fed. Cir. 1983), *cert denied*, 469 U.S. 851 (1984).

affidavit of such employee, and such affidavit shall be subject to contradiction or explanation by the affidavits of the applicant and other persons.

The elements of the Applicant's amendment to the claims are not disclosed or taught by the cited reference. The Applicant respectfully request withdrawal of the rejection under 35 U.S.C. § 103(a) that a suitable reference be provided with a citation to the portion of the reference that discloses the elements of the Applicant's invention or an affidavit under 37 C.F.R. §1.107(b) with respect to any rejection based partly on the Examiner's personal knowledge or judicial notice be provided.

Because acrylic acid is an easily polymerizing compound, when propylene gas is provided in high concentration to the reactor, it is liable to generate an acrylic acid polymer at both the step for absorbing acrylic acid and the subsequent step for purification of the absorbed acrylic acid. As a result, when the concentration of acrylic acid is depressed by a variation in the composition of the bottom liquid of an absorption column, the maintenance of distillation conditions in a high acrylic acid concentration results in generation of an acrylic acid polymer in a distilling column. Additionally, the purification step of acrylic acid is often accomplished by adopting a series of different distilling columns, called a dehydrating column, a light ends cut column, and a heavy ends cut column. As a result of this arrangement the control of the purification is difficult as a result of the fact that a variation in the composition of the bottom liquid of any one of such distilling columns necessitates a change in the purification conditions of the subsequent steps. See, page 5, line 6 to page 6, line 6 in the specification.

By the invention as currently claimed, acrylic acid can be produced with improved productivity from propylene of high concentration in the reactor, and moreover, the

operation of the purification process can be simplified by providing high concentration of propylene to a reactor. Particularly by limiting the water content in the bottom liquid of the absorption column in the range of 1 - 45 wt. %, the occurrence of a polymer at the subsequent steps of the process can be effectively prevented. The control of the water content can be attained by adjusting the amount of an absorbent. Further, by focusing the acrylic acid concentration of bottom liquid in the absorption column at a narrow range within 1 - 45 wt. %, it is now possible to restrain the fluctuations of loss of acrylic acid in the absorption column and secure the stability of operation at the subsequent steps including the equipment for the treatment of the waste water by preventing polymerization. See Specification page 6, line 20 to page 7, line 10.

Claims 1 and 4 as currently amended now recite the limitation, "wherein said absorbent is introduced into said acrylic acid absorption column at a mass flow rate in the range of 0.1 - 1.5 times the mass flow rate of propylene introduced into said first reactor." By this feature the treatments at the subsequent downstream series of steps can be simplified and the variations restrained. See specification page 30, line 11 to page 31, line 25.

In contrast to the present invention, Kadowski relates to a process for producing acrylic acid by a two-stage gas-phase catalytic oxidation including specific conditions (such as step A to D in claim 1) but does not teach or suggest such acrylic acid solution with a water concentration as recited in the invention as presently claimed. The Office Action indicates that Kadowski neither discloses nor suggests the absorption step b), resulting in a acrylic acid containing solution with a water concentration in the range of 1

- 45 wt. %, but asserts that one of ordinary skill in the art would expect that concentration of acrylic acid in the resulting solution of Kadowaki would be in this broad range of 1 to 45 % (water), and the record does not contain any objective evidence to the contrary.

However, such an expectation is not supported by Kadowski. Kadowski only discloses a process for producing acrylic acid by a two-stage gas-phase catalytic oxidation reactor; it does not describe or teach a step with introducing the acrylic acid-containing gas into an acrylic acid absorption column and causing it to contact an absorbent after the oxidation reaction of propylene. Furthermore, Kadowski also does not teach or suggest any polymerization of the acrylic acid in the acrylic acid production process and purification process.

The advantages of the invention as currently claimed are illustrated by a comparison of the Examples in the specification. Example 1, performed at a mass flow ratio of the amount of absorbent/propylene within the scope of claim 1 as currently amended, and Example 6, performed at a mass flow ratio of the amount of the absorbent/propylene fixed outside of the claimed mass flow rate range, produced the following results:

	Example 1	Example 6
Mass flow ratio of the amount of absorbent/propylene	0.9	1.6
Efficiency of absorption	98.3%	97.1%
Polymer	Not detect	Detected in column

As the Examiner has failed to make a prima facie case of based on the cited prior art, applicant respectfully requests withdrawal of the rejected under 35 USC 103(a).

### III. Summary

By this amendment, applicant has amended the claims to more clearly state the present invention. Applicant believes that claims 1 & 2-7, the only remaining claims are in condition for allowance.

Should there remain any questions or other matters whose resolution may be advanced by a telephone call, the Examiner is cordially invited to contact the applicant's undersigned attorney at his number below.

Respectfully submitted,

  
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